

January 2012

# HOMELAND DEFENSE

## Continued Actions Needed to Improve Management of Air Sovereignty Alert Operations



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## Why GAO Did This Study

In the 11 years since September 11, 2001, the U.S. government has put forth extensive efforts to protect the nation's aviation sector and airspace. These efforts include air sovereignty alert (ASA) operations, for which the Air Force provides personnel and fully fueled, fully armed aircraft sitting on constant alert at 18 sites across the United States. In 2009, GAO found shortcomings in the Department of Defense's (DOD) management of ASA operations, leading to a number of GAO recommendations. For this report, GAO examined the extent to which (1) the Air Force has implemented GAO's 2009 recommendations, (2) DOD has implemented a risk-based management approach for ASA operations, and (3) the Air Force has accurately identified expenditures for ASA operations. To do so, GAO analyzed relevant strategies, planning documents, guidance, and expenditure data; and interviewed North American Aerospace Defense Command (NORAD), Air Force, National Guard Bureau, and other DOD officials.

## What GAO Recommends

Congress may wish to consider requiring the Air Force to fully implement GAO's 2009 recommendations. In addition, GAO recommends that DOD improve its risk management of ASA operations and improve the Air Force's ability to accurately identify ASA expenditures. DOD fully or partially agreed with all of GAO's recommendations.

## HOMELAND DEFENSE

### Continued Actions Needed to Improve Management of Air Sovereignty Alert Operations

## What GAO Found

The Air Force has not fully implemented the recommendations from GAO's 2009 report. With regard to GAO's recommendation that the military services should formally assign ASA duties to the units that consistently conduct them and ensure that the readiness of those units is fully assessed, the Air Force did so. However, the National Guard Bureau is considering reversing that action because it believes that the recommendation can be better addressed through the Air Force's standard deployment process. The Air Force has also not established a timetable to implement ASA as a steady-state mission; has not developed and implemented a plan to recapitalize the aging fighter aircraft that conduct ASA operations before the end of their service lives; and, when ASA units are deployed to support other ongoing operations, the Air Force continues to identify replacement units to perform the ASA mission on an ad hoc basis. All of the above were related to recommendations GAO made to the Air Force in its 2009 report. Separately, GAO found considerable confusion about the capabilities associated with ASA operations in part because, in September 2011, NORAD stopped using the term "air sovereignty alert" and created a new term, "aerospace control alert" (ACA), without clearly defining ACA or the missions that are now included within it.

DOD has taken a series of actions for ASA operations that are consistent with a risk-based management approach. However, several key actions have yet to be taken that would enable the department to better balance risk and costs. Risk-based management includes conducting routine risk assessments that evaluate threats, vulnerabilities, and criticality of assets, as recommended in GAO's 2009 report, and selecting between alternative courses of action to mitigate risk and make decisions about allocating resources. Although threats to the nation's air sovereignty continue to emerge and evolve, GAO found that DOD is unable to measure the extent to which ASA helps to achieve the department's homeland-defense goal of securing the United States from direct attack because DOD has not established performance measures. NORAD has not conducted routine risk assessments of ASA operations. DOD has also yet to conduct a cost-benefit analysis for two of the three alternatives to current ASA operations that GAO evaluated. Adopting a more-rigorous risk-based management approach—including balancing risk and costs—would help policymakers within DOD and elsewhere more effectively allocate finite DOD resources.

Weak internal controls limit the ability of the Air Force and National Guard Bureau to accurately identify ASA expenditures. GAO analyzed the fiscal year 2010 expenditure information that the Air Force and National Guard Bureau submitted to Congress along with DOD's fiscal year 2012 budget justification and found the reported expenditures of more than \$246 million to be inaccurate. For example, GAO found that the Air Force overstated ASA flying-hour expenditures by at least \$22 million and included expenditures related to national special-security events, which are not part of ASA operations. GAO found that the Air Force's ability to identify ASA expenditures is limited by unclear roles and responsibilities for programming and budgeting and a lack of guidance on defining and tracking ASA expenditures. These types of internal controls are important to ensuring basic accountability, maintaining funds control, and preventing fraud and abuse.

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## Abbreviations

ACA	Aerospace Control Alert
ASA	Air Sovereignty Alert
DOD	Department of Defense
NORAD	North American Aerospace Defense Command
OMB	Office of Management and Budget

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United States Government Accountability Office  
Washington, DC 20548

January 31, 2012

## Congressional Requesters

Since the September 11, 2001, terrorist attacks, the U.S. government has taken extensive efforts to protect the aviation sector and airspace over the United States—including the establishment of restricted flight zones; installation of hardened cockpit doors; enhanced screening of airline passengers and baggage before flights; increased use of air marshals on selected flights; the vigilance of civilian passengers and flight attendants aboard commercial aircraft; and having fully fueled, fully armed jets ready to scramble at any time in response to airborne threats. As a result of these efforts, the Transportation Security Administration believes that a hijacking scenario over the United States remains a possibility although it is less likely to occur today. Other threats to the nation's air sovereignty continue to emerge and evolve.<sup>1</sup> As a part of the federal government's overall efforts to protect U.S. airspace, the Department of Defense (DOD) performs Operation Noble Eagle, which consists of several operations, including the maintenance of fighter aircraft and trained personnel on alert 24 hours a day, 365 days a year, at 18 alert sites across the United States.<sup>2</sup> Since its inception in 2003, these efforts have been commonly referred to as air sovereignty alert (ASA) operations. The ASA sites serve to deter, respond to, and if necessary, defeat airborne threats over the United States and Canada. In effect, these fighter jets can be the last line of multiple layers of defense.

As a component of Operation Noble Eagle, ASA operations are conducted by several DOD components under the command of North

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<sup>1</sup>Airborne threats to the nation can come from a range of vehicles (e.g., commercial, general aviation, cargo, ultra light, and military aircraft and cruise missiles) and modes of attack (e.g., detonating explosives on board, hijacking, crashing the aircraft, and launching of weapons).

<sup>2</sup>Operation Noble Eagle, which was initiated after the terrorist attacks of September 11, 2001, is DOD's umbrella homeland defense operation for North America and Hawaii. There are a variety of missions that could be conducted underneath this umbrella operation. For example, North American Aerospace Defense Command (NORAD) could conduct irregular air patrols above major metropolitan areas and critical infrastructure facilities as well as maintain an alert force of fighter, tanker, and control aircraft. Aircraft sorties and alert commitments are based on a tiered response system. As threat levels intensify, the number of aircraft on alert and on patrol increases.

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American Aerospace Defense Command (NORAD) for the airspace over North America, which includes Alaska and the continental United States, and under the command of U.S. Pacific Command for the airspace over the state of Hawaii and U.S. territories in the Pacific. The Joint Chiefs of Staff have directed the Air Force (among other components) to provide support for ASA operations. Generally, Air National Guard aircraft and personnel are used for alert, since the National Guard Bureau believes that ASA operations are consistent with the Air National Guard's homeland mission. Both the Air Force's Air Combat Command and the National Guard Bureau<sup>3</sup> believe that Air National Guard units can conduct alert duty with less effect on overseas missions and at a lower cost than active-duty Air Force units. Consequently, Air National Guard units are on alert at 17 of the 18 ASA sites. In addition, units at all 18 ASA sites (i.e., both Air National Guard and active-duty personnel) are dual-tasked to conduct both expeditionary missions, such as Operation Enduring Freedom in Afghanistan, and ASA operations.

In January 2009, we issued a report that identified a number of shortcomings in DOD's management of ASA operations.<sup>4</sup> First, we found that NORAD faced difficulty determining the appropriate levels and types of units, personnel, and aircraft for ASA operations. We also found that, after 8 years of operations, the Air Force had not yet established ASA as a steady-state mission, which would include integrating ASA operations into the Air Force's planning, programming, and budgeting cycle. Partly resulting from the absence of a steady-state mission, NORAD had only partially assessed the readiness of units that consistently conduct ASA operations to ensure that those units were organized, trained, and equipped to perform ASA operations. In addition, we found that the Air Force faced significant challenges replacing or extending the service life of aging fighter aircraft, to the extent that, if aircraft were not replaced, 11

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<sup>3</sup>The National Guard Bureau is a joint function within the DOD that, among other things, participates with staffs from the Department of Army and the Department of Air Force in the formulation, development, and coordination of all programs, policies, concepts, and plans pertaining to or affecting the National Guard, the Army National Guard of the United States, and the Air National Guard of the United States. The Air National Guard of the United States is a reserve component of the U.S. Air Force.

<sup>4</sup>GAO, *Homeland Defense: Actions Needed to Improve Management of Air Sovereignty Alert Operations to Protect U.S. Airspace*, [GAO-09-184](#) (Washington, D.C.: Jan. 27, 2009). In addition, GAO testified on this topic in April 2009, GAO, *Homeland Defense: Actions Needed to Address Management of Air Sovereignty Alert Operations to Protect U.S. Airspace*, [GAO-09-612T](#) (Washington, D.C.: Apr. 22, 2009).

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of the 18 ASA sites could be without aircraft by 2020. On the basis of those findings, we identified a number of actions that DOD needed to take to improve management of ASA operations. Specifically, we recommended that DOD should conduct routine risk assessments as part of a risk-based management approach, implement ASA as a steady-state mission, and develop plans to address future challenges.

GAO and other federal agencies have long advocated the use of a risk-based management approach to enhance preparedness against potential terrorist threats.<sup>5</sup> Risk management is a systematic, analytical process to determine the likelihood that a threat will harm physical assets or individuals and then to identify actions to reduce risk and mitigate the consequences of an attack. The principles of risk management acknowledge that while risk generally cannot be eliminated, enhancing protection from known or potential threats can serve to reduce risk. Key elements of risk management include assessing threats, vulnerabilities, and criticality of assets and selecting between alternative courses of action to mitigate risk. As we have previously reported, risk management can help policymakers make informed decisions, take actions, and prioritize resource investments under conditions of uncertainty. For additional information, see the Related GAO Products list at the end of this report.

On the basis of your request that we review DOD's actions on our January 2009 recommendations, other issues associated with ASA operations, and the Air Force's ability to sustain those capabilities, this report examines the extent to which (1) the Air Force has implemented the recommendations made to the service in our 2009 report, (2) DOD has implemented a risk-based management approach for ASA operations—including our 2009 recommendation for routine risk assessments—that balances risk with cost, and (3) the Air Force accurately identified expenditures for its ASA operations. We are also issuing a classified version of this report. That version includes a classified appendix of our analysis of NORAD's ASA basing model.

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<sup>5</sup>GAO, *Homeland Security: Key Elements of a Risk Management Approach*, [GAO-02-150T](#) (Washington, D.C.: Oct. 12, 2001); *Intelligence, Surveillance, and Reconnaissance: DOD Needs a Strategic, Risk-Based Approach to Enhance Its Maritime Domain Awareness*, [GAO-11-621](#) (Washington, D.C.: June 20, 2011); *Joint Strike Fighter: Strong Risk Management Principles Essential as Program Enters Most Challenging Phase*, [GAO-09-711T](#) (Washington, D.C.: May 20, 2009); DOD Instruction, 3020.45, *Defense Critical Infrastructure Program (DCIP) Management* (Apr. 21, 2008).



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To determine the extent to which the Air Force has implemented the recommendations from our 2009 report, we reviewed ASA-related guidance, plans, and other documents from the Office of the Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs, Air Force's homeland defense office, Air Force's Air Combat Command, National Guard Bureau, and 3 of the 18 ASA units. We also interviewed officials from these organizations. To determine the extent to which DOD has adopted a risk-based management approach to balance risk and costs for ASA operations, we evaluated documents and interviewed officials from NORAD, the Office of the Assistant Secretary of Homeland Defense and Americas' Security Affairs, the Air Force, and the National Guard Bureau. On the basis of our analyses of these documents and discussions, we compared actions that DOD has taken to three of the five phases within GAO's risk-based management framework.<sup>6</sup> To determine the extent to which the Air Force was able to accurately identify ASA expenditures, we analyzed the fiscal year 2010 expenditure information the Air Force included in ASA budget justification materials provided to Congress in support of the fiscal year 2012 budget and documented the steps taken to identify those expenditures through interviews, e-mails, and related documentation. We also compared the practices used by the Air Force to prepare the ASA budget justification against best practices for producing cost estimates.<sup>7</sup> To determine the expenditures of each ASA site, we developed a survey that we sent out to the Air National Guard and active-duty Air Force ASA units to gather fiscal year 2009 and 2010 expenditures. We were provided information from 18 of the 19 ASA sites that incurred expenditures for ASA

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<sup>6</sup>We could not evaluate the extent to which DOD implemented the last two phases—management selection and implementation and monitoring—because (1) DOD had not fully implemented the first three phases of GAO's risk-based management framework, which are essential for the latter two phases, and (2) DOD was still in the decision-making stage for the alternatives that we identified.

<sup>7</sup>GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, [GAO-09-3SP](#) (Washington, D.C.: March 2009).

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operations.<sup>8</sup> Of the 18 sites that provided us information, 3 of the sites provided us incomplete information.<sup>9</sup>

We conducted this performance audit from March 2011 to January 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Additional information on our scope and methodology appears in appendix I.

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## Background

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### ASA Operations

ASA operations consist of ground operations that take place before fighter aircraft take off, including such activities as maintaining the fighter aircraft. They also include those activities that may take place after a unit receives an alert from NORAD, but before the aircraft are airborne. For example, pilots and maintenance personnel may rush from their nearby lodging facility to the alert aircraft facility, where maintenance personnel conduct final preparations while the pilots sit in their aircraft awaiting further instruction (battle station). Alternatively, pilots may taxi the aircraft to the end of the runway and await further instruction (runway alert) or take off in response to the alert (scramble).

Once aircraft take off, an Air National Guard pilot converts from Title 32 status under the command and control of the state governor to federal

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<sup>8</sup>There are 18 steady-state ASA sites. However, in fiscal year 2010, McEntire Joint National Guard Base, South Carolina, constructed and upgraded facilities since it was going to take on alert duty from Shaw Air Force Base, South Carolina, at the beginning of fiscal year 2011. Therefore, we included McEntire Joint National Guard Base's fiscal year 2010 expenditures in our survey efforts. Budget officials from Elmendorf Air Force Base, Alaska, told us that they were unable to provide us accurate ASA expenditure information because the base does not track ASA expenditures separately from its other mission expenditures.

<sup>9</sup>Budget officials from Shaw Air Force Base, South Carolina; Homestead Air Force Base, Florida; and Hickam Air Force Base, Hawaii, were unable to provide us information for some aspects of the operation, such as flying hour or personnel expenditures.

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Title 10 status under the command and control of NORAD.<sup>10</sup> Within limits, NORAD can increase personnel, aircraft, and the number of ASA sites based on changes in the threat conditions.

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## Risk-Based Management Approach

GAO has previously reported that a risk-based management approach helps policymakers make informed decisions and prioritize resource investments. Risk management is a widely endorsed strategy for helping decision makers allocate finite resources and take action under conditions of uncertainty. We have previously recommended a five-phase risk-based management approach as shown in figure 1.

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Figure 1: GAO's Risk-Based Management Framework



Source: GAO.

The framework is dynamic and new information can be entered at any phase. The framework can be used to inform agency officials and

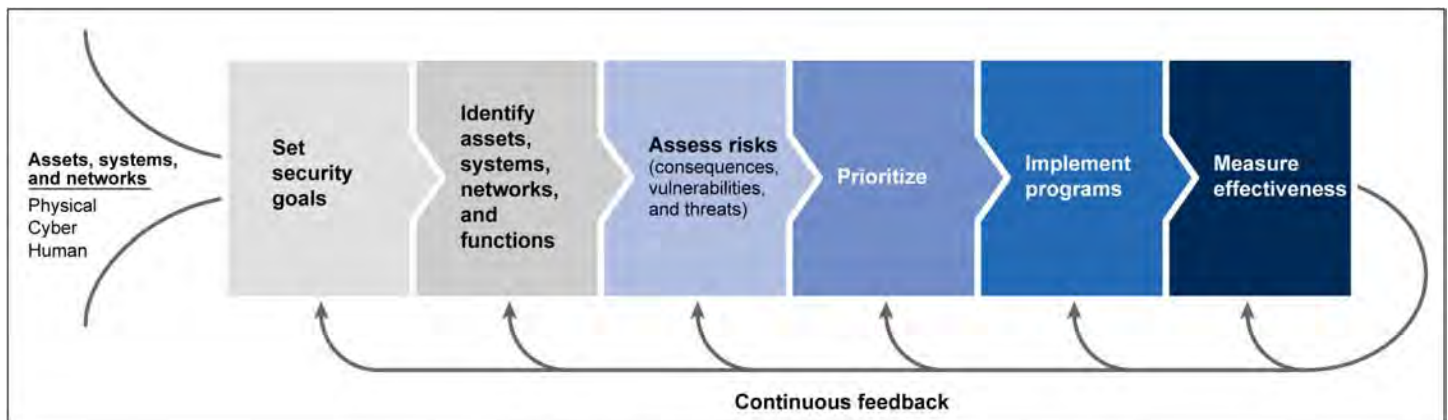
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<sup>10</sup>Title 32 and Title 10 refer to sections of the United States Code.

decision makers of the basic components of a risk-based management approach or can be used as a stand-alone guide. The risk-based management approach, as outlined above is designed to be flexible in that the approach may be applied at various organizational levels from a department or a multiagency organization down to specific projects or operations, such as ASA operations.

As we previously reported, because there is no one uniformly accepted approach to risk management, terms and activities may differ across applications. For example, the Department of Homeland Security's 2009 National Infrastructure Protection Plan identifies a six-phase risk-management framework as shown in figure 2.<sup>11</sup> The overall difference between this framework and GAO's is that the National Infrastructure Protection Plan's framework splits GAO's risk-assessment phase into two separate phases.

**Figure 2: National Infrastructure Protection Plan's Risk-Management Framework**



Source: Department of Homeland Security.

According to the 2009 National Infrastructure Protection Plan, the core criteria for risk assessments include information needed to understand and address each of the following components of risk—threat, vulnerability, and consequence. Any approach that omits the substance of the steps may result in resources that are not targeted to the highest

<sup>11</sup>Department of Homeland Security, *National Infrastructure Protection Plan* (2009).

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security needs. In addition, failing to monitor the implementation of countermeasures, including those implemented by other agencies, may result in a misallocation of resources. Similarly, failing to conduct routine or periodic assessments of programs or operations could result in missed opportunities to increase their efficiency and effectiveness.

DOD, itself, has identified risk management, in this context, as a process of systematically identifying, assessing, and managing risks arising from operational factors and making decisions that balance cost with mission benefits. For example, DOD's defense critical infrastructure program is a risk-management program that seeks to ensure the availability of certain identified assets critical to DOD missions. Activities include the identification, assessment, and security enhancement of assets essential for executing the National Military Strategy. The Defense Logistics Agency similarly established its enterprise risk-management approach to identify, assess, communicate, and manage risk in a cost-effective manner.

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## The Air Force Has Not Fully Implemented the Recommendations from Our 2009 Report, and Mission Confusion Persists

The Air Force has fully implemented one recommendation from our 2009 report, but has not fully implemented the remaining four recommendations. In addition, confusion over the definition and scope of the mission perpetuates confusion about the capabilities and expenditures associated with the mission.

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### Air Force Has Taken Partial Steps to Implement Recommendations



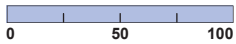
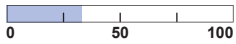
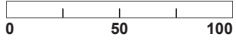
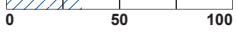
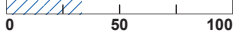
As of November 2011, the Air Force had fully implemented one of the five recommendations from our 2009 report<sup>12</sup> and taken partial steps to implement the remaining four recommendations, as shown in figure 3 below. We made the following recommendations: (1) to formally assign ASA duties to the appropriate units; (2) to implement ASA as a steady-state mission; (3) to establish a timetable for implementation of the preceding recommendation; (4) to develop and implement a plan to



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<sup>12</sup>[GAO-09-184](#).

address any projected capability gaps; and (5) to develop and implement a formal method to replace deploying units.

**Figure 3: Air Force's Implementation of Our 2009 Recommendations as of November 2011**

<div>  Click on a recommendation to see the actions taken. Click on the "x" to clear.  See appendix II for the non-interactive, printer-friendly version. </div>		
Recommendation	Grade	Actions taken
We recommend that the Secretary of Defense direct the military services with units that consistently conduct ASA operations to formally assign ASA duties to these units and then ensure that the readiness of these units is fully assessed, to include personnel, training, equipment, and ability to respond to an alert.		
We recommend that the Secretary of Defense direct the Secretary of the Air Force to implement ASA as a steady-state mission according to NORAD, DOD, and Air Force guidance by: (1) incorporating ASA operations within the Air Force submissions for the 6-year Future Years Defense Program; (2) updating the Air Force homeland defense policy, homeland operations doctrine, and concept of operations to incorporate and define the roles and responsibilities for ASA operations; and (3) updating and implementing the ASA program action directive.		
We recommend that the Secretary of Defense direct the Secretary of the Air Force to establish a timetable to implement ASA as a steady-state mission [by taking the actions identified in the preceding recommendation].		
We recommend that the Secretary of Defense direct the Secretary of the Air Force to develop and implement a plan to address any projected capability gaps in ASA units due to the expected end of the useful service lives of their F-15 and F-16 fighter aircraft.		
We recommend that the Secretary of Defense direct the Secretary of the Air Force to develop and implement a formal method to replace deploying units that still provides unit commanders flexibility to coordinate replacements.		

 Recommended action complete  
 Recommended action underway

Source: GAO analysis of DOD information.

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We continue to believe that the prior recommendations have merit and that by not fully addressing the recommendations, DOD could leave the long-term sustainability of ASA operations at risk. Since the 2009 report was issued, some issues have arisen that might have been averted had the Air Force implemented the recommendations. For example, since the Air Force canceled the ASA program action directive that clearly identified the service's Air Combat Command as responsible for programming for ASA operations, the National Guard Bureau assumed programming and budgeting for its ASA sites to ensure that its units that were conducting ASA operations were funded. This in turn has led to the National Guard Bureau having to fund emergent expenses with funds that were programmed for other purposes. For example, according to National Guard Bureau officials, when an ASA site is undergoing certain unplanned construction, the National Guard Bureau must fund the transfer of ASA personnel and equipment to a separate base.

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**Undefined New Terminology Regarding ASA Operations Perpetuates Confusion about the Mission**

Further complicating DOD's management approach to ASA operations, we found considerable confusion about the capabilities and expenditures associated with ASA operations. In September 2011, NORAD stopped using the term "air sovereignty alert" (ASA) and created a new term, "aerospace control alert" (ACA) without clearly defining ACA or the capabilities that are now included within it. When we asked NORAD officials which capabilities are included under ACA, they told us that ACA includes—but is not limited to—DOD's traditional scope of ASA operations (i.e., the dedicated fighter aircraft and personnel at 18 steady-state alert sites across the United States), as well as a more-comprehensive list of capabilities used in their aerospace control mission.<sup>13</sup> As figure 4 shows, according to NORAD, ACA capabilities include air defense and air sovereignty operations personnel and equipment at command and control centers at NORAD and elsewhere, ground-based defense systems, air patrols, airborne radar, and air-to-air refuelers—in addition to ASA fighters sitting on ground alert. However, Air Force and National Guard Bureau officials told us that while they were uncertain as to the definition of ACA, they believe the new term is

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<sup>13</sup>NORAD has three overall missions: aerospace warning, aerospace control, and maritime warning. According to NORAD's most-recent chartering agreement, aerospace control includes providing surveillance and exercising operational control of the airspace of Canada and the United States.



interchangeable with ASA (i.e., the dedicated fighter aircraft and personnel at 18 steady-state alert sites across the United States).

Figure 4: Air Sovereignty Alert (ASA) versus Aerospace Control Alert (ACA)

**Interactivity instructions:** Click on a photo thumbnail to view larger.

### Air Sovereignty Alert



Fighters on ground alert

### Aerospace Control Alert

Aerospace Control is the combination of air sovereignty mission (i.e., know and control what is flying in U.S. and Canadian airspace) and air defense mission (i.e. measures designed to defend against attacking enemy aircraft or missiles). According to NORAD officials, ACA is the capabilities (i.e., personnel and equipment) that are on some type of alert to support the broader mission.



Fighters on ground alert



Refuelers



Air patrols



Airborne radar



Ground-based defense system



Joint Air Defense Operations Center (JADOC)



Western Air Defense Sector (WADS) and Eastern Air Defense Sector (EADS)



Continental NORAD Region Command's (CONR) and Alaskan NORAD Region Command's (ANR) Air Operations Centers



NORAD / NORTHCOM Command and Control Center

Source: NORAD and DOD.



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While NORAD's new terminology may better reflect its overall aerospace-control mission, without a clear definition of what capabilities and expenditures are related to ACA—compared to ASA—Congress will lack a complete picture of the funding and other resources needed for DOD to conduct ASA operations (i.e., the dedicated fighter aircraft and personnel at 18 steady-state alert sites across the United States). DOD is required by law to submit a consolidated budget justification document annually that includes all funding requirements for ASA operations. As will be discussed in more detail later in this report, even before the change in terminology, the Air Force and National Guard Bureau faced difficulties providing Congress with complete and accurate information regarding expenditures associated with ASA operations. During our review, officials from NORAD, the Office of the Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs, the Joint Chiefs of Staff, U.S. Pacific Command, the Air Force, and the National Guard Bureau could not consistently define what capabilities and expenditures should be considered part of ASA. Until DOD defines ACA; identifies the specific capabilities that support it—including personnel and equipment; and distinguishes the place of ASA within that mission for the purposes of providing consistent information in response to their budget-justification requirement, Congress, NORAD, and other entities within DOD could be making important homeland security decisions based on inconsistent information.

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## **DOD Has Not Fully Implemented a Risk-Based Management Approach That Balances Risk and Costs for ASA Operations**

DOD has taken a series of actions for ASA operations that are consistent with a risk-based management approach; however, several key actions have yet to be taken to fully implement a risk-based management approach that would enable the department to better balance risk and costs.

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### **Risk Management Helps Balance Risk and Costs**

According to our prior work, an ongoing risk-based management approach is a best practice that enhances an organization's decision making, including determining operational requirements, and helps to guide the use of limited resources. We have previously recommended a five-phase approach to a risk-management framework, including: strategic goals and objectives, risk assessment, evaluation of alternatives, management selection, and implementation and monitoring.

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Risk management is a widely endorsed strategy for decision makers to allocate finite resources and take action under conditions of uncertainty. For example, the 2009 National Infrastructure Protection Plan states that its risk management framework integrates and coordinates strategies, capabilities, and governance to enable risk-informed decision making related to the nation's critical infrastructure and key resources. This framework is applicable to threats such as natural disasters, manmade safety hazards, and terrorism, although different information and methodologies may be used to understand each.

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**DOD Has Established and Linked Its Homeland Defense Strategic Goal to Its ASA Objectives, but Has Not Established Performance Measures**

DOD's overarching homeland defense goal is to secure the United States from direct attack, but DOD is unable to measure the extent to which ASA operations help to achieve that goal. In its 2005 Strategy for Homeland Defense and Civil Support, DOD linked homeland defense with several objectives associated with ASA operations—including deterring, detecting, and if necessary, defeating airborne threats.<sup>14</sup> While these actions are initial steps in the first phase of a risk-based management approach, NORAD has not identified performance measures that could identify the extent to which its ASA operations are progressing toward DOD's homeland defense goal and objectives.<sup>15</sup> While U.S. Pacific Command has established one type of performance measure identified in Joint Chiefs of Staff doctrine on joint planning (measures of effectiveness), the command has not established the other type of performance measure (measures of performance). U.S. Pacific Command officials also recognized that the command's performance measures may not be comprehensive since its single ASA site does not deal with the same operational tempo as the other 17 ASA sites. According to Joint Chiefs of Staff doctrine on planning, continuous evaluation of operations against measures of performance and measures of effectiveness to assess the component's progress toward accomplishing a task or achieving an objective is a key component of DOD's planning process. Measures of effectiveness are criteria used to assess changes in system behavior, capability, or operational environment that are tied to measuring the attainment of an end state or

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<sup>14</sup>DOD, *Strategy for Homeland Defense and Civil Support* (Washington, D.C.: March 2005).

<sup>15</sup>For purposes of this report, performance measures refer to both measures of effectiveness and measures of performance.

an objective, or creation of an effect. Measures of performance are criteria to assess friendly actions that are tied to measuring task accomplishment. To provide examples of performance measures that could be applied to ASA operations, we created potential measures of effectiveness and measures of performance after analyzing NORAD and DOD planning documents and talking with NORAD and DOD officials, including ASA units. Table 1 lists some of the potential measures we developed. NORAD and DOD officials agreed that these examples could be a viable start for a more comprehensive list of performance measures to evaluate the effectiveness and performance of ASA operations.

**Table 1: Nonexhaustive GAO-Developed List of Potential Measures of Effectiveness and Measures of Performance for ASA Operations**

Measures of effectiveness	Measures of performance
Number of track-of-interest infractions within the Special Flight Restricted Area within a certain period of time.	Number (or percentage) of times ASA aircraft launch within Operation Noble Eagle requirements.
Number and type of aircraft declared to be of interest within an established Temporary Flight Restricted Area within a certain period of time.	Number (or percentage) of times ASA aircraft launch within NORAD established requirements.
Number of track-of-interest aircraft that divert after certain tactics, techniques, and procedures are performed.	Number (or percentage) of times ASA pilots are able to accurately identify and communicate track-of-interest aircraft tail number to command and control entities within 5 minutes.
Total number of commercial and general-aviation aircraft declared to be a track of interest within a certain metropolitan area within a certain period of time.	Number of Alert Force Evaluations failed each year.

Source: GAO analysis of DOD data.

Measuring the status of tasks, effects, and objectives becomes the basis for reports to senior commanders and civilian leaders on the progress of the operation. NORAD could then advise the President and the Secretary of Defense accordingly and adjust operations as required. When we discussed the lack of performance measures with DOD officials, they acknowledged that such information would be helpful yet did not exist for ASA operations.

DOD officials pointed out that NORAD evaluates each ASA unit generally every 20 months. As we previously reported, NORAD's unit assessments evaluate the quality of alert aircraft, to include the overall condition of the aircraft, and a unit's ability to respond to different air sovereignty

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scenarios.<sup>16</sup> While these assessments evaluate the equipment and operations of a single ASA unit against a planned scenario, the individual assessments do not provide NORAD or DOD situational awareness of actual ASA operations that occur every day (as opposed to planned evaluations); do not allow either NORAD or DOD to identify trends across ASA units; and do not provide NORAD or DOD criteria with which to evaluate the effectiveness and performance of ASA operations against DOD's overall homeland-defense goal. Without ASA performance measures, NORAD and DOD are limited in their ability to assess ASA operations.<sup>17</sup>

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### NORAD Has Not Conducted Routine Risk Assessments, and Its ASA Model Has Limitations

Although we have previously recommended that NORAD should conduct routine risk assessments of ASA operations<sup>18</sup>—the second phase of a risk-based management approach—we found that it has not implemented this recommendation. Specifically, our 2009 ASA report stated that by undertaking routine risk assessments, NORAD could better evaluate the extent to which previous threats have been mitigated by DOD or other government agencies; better evaluate current and emerging threats to determine which ones require the most urgent attention; and determine operational requirements to address changing conditions. Moreover, routine risk assessments could help NORAD evaluate alternatives to current operations, especially in a resource-restricted environment. Further, such assessments could enhance NORAD's ability to determine and apply the appropriate level and type of resources—including units, personnel, and aircraft—to ASA operations.

Although NORAD has not conducted routine risk assessments, it took steps toward implementing our 2009 recommendation by developing a computer model to evaluate current ASA basing locations. However, we found that the model had certain limitations that limit its ability to provide NORAD commanders, DOD decision makers, and Congress risk-based information. Specifically, it did not include a prioritized list of metropolitan areas and critical infrastructure locations that NORAD should protect. The

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<sup>16</sup>[GAO-09-184](#).

<sup>17</sup>According to DOD's joint doctrine on planning, an assessment with performance measures should answer two questions: (1) Is the Joint Force Commander doing things right? and (2) Is the Joint Force Commander doing the right things?

<sup>18</sup>[GAO-09-184](#).

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2009 National Infrastructure Protection Plan states that identifying and prioritizing key assets to protect, such as metropolitan areas and critical infrastructure, is a key component for risk management. According to NORAD officials, the model omitted this information because DOD had not issued additional guidance since the initial lists were distributed after the September 11, 2001, terrorist attacks. The model also did not incorporate data that are associated with risk: threat, vulnerability, and consequence because NORAD designed the model to assess the ability of its aircraft to respond to a single type of threat regardless of its location in the United States.

We also found some limitations with the assumptions and reliability of the input data used by NORAD's computer model.<sup>19</sup> NORAD officials agreed with our observations and agreed to take action to address them. Further, we found that while NORAD officials regularly run queries using the model, they do not generate reports documenting the results of their analyses. GAO's Standards for Internal Control in the Federal Government recommends ongoing monitoring, in addition to separate evaluations, to assess the quality of performance over time and ensure that the findings of audits and other reviews are promptly resolved.<sup>20</sup> A report that documents the model's analyses may allow analysts to routinely identify trends over a period of time so that commanders could determine the extent to which their operations are effective or to which a threat might be evolving. We believe that NORAD's computer model, if properly designed, could sufficiently address our 2009 recommendation to conduct routine risk assessments, as well as allow NORAD to assess the specifics of detailed ASA scenarios. These areas of improvement are consistent with DOD methodology used in other DOD risk-management efforts, such as force protection and defense critical infrastructure, as well as the U.S. Coast Guard's and the Transportation Security Administration's risk-based efforts. Similarly, The National Strategy for the Physical Protection of Critical Infrastructures and Key Assets states that responsible authorities using models and simulations can evaluate the risk associated with particular vulnerabilities more accurately and

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<sup>19</sup>Specific information about the model's inputs and areas for improvement are provided in the classified version of this report.

<sup>20</sup>GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

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subsequently make more-informed protection decisions.<sup>21</sup> Without conducting routine risk assessments or maintaining a risk-based computer model that includes key components identified above, DOD will be unable to identify and assess the level of risk that it is taking; evaluate its ASA posture as the threat evolves or is mitigated by other U.S. government efforts; and make risk-based decisions, especially in a constrained fiscal environment. In addition, without documenting the results of risk assessments or the analyses that are completed using data from the computer model, DOD will be limited in its ability to identify trends in threats, vulnerabilities, and potential consequence over time.

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### DOD Has Considered Costs and Benefits of One of Three Alternatives to ASA Operations

We identified three alternatives to DOD's current ASA operations that the department has considered since 2009, and DOD has analyzed costs and benefits of these alternatives to varying extents. During this review, we found that DOD has considered the following three alternatives to its current ASA posture: establish a new ASA site to support the President while in Chicago; acquire additional capabilities to address a perceived threat; and modify the current number and location of ASA sites. Of these three alternatives, we determined that DOD conducted a cost-benefit analysis for one of the alternatives, but had not conducted a cost-benefit analysis on the other two alternatives at the time of our review. According to GAO's risk-based management framework, weighing costs and benefits is a critical component of risk management when choosing among alternative security measures because it links the benefits of alternatives to the costs associated with implementing and maintaining them. The actions that DOD should take in the "risk-assessment" phase should be the basis for identifying and considering alternatives. Capital investments of federal expenditures generally require a cost-benefit or cost-effectiveness approach.<sup>22</sup> We analyzed the three alternatives to ASA operations that DOD officials told us they had considered since 2009:

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<sup>21</sup>White House, *The National Strategy for the Physical Protection of Critical Infrastructures and Key Assets* (February 2003).

<sup>22</sup>Office of Management and Budget (OMB) circulars A-11 (sect. 7), A-94, and A-130 generally apply to capital investments. For example, OMB Circular A-94 outlines procedures for cost-benefit analysis that are suggested for use in the internal planning of executive-branch agencies, but are mandatory in certain contexts, such as for analyses submitted to OMB in support of budget programs pursuant to OMB Circular A-11.

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- *Establish a new ASA site to support the President while in Chicago.* DOD evaluated the possibility of establishing a new ASA site in the Chicago metropolitan area to support the President's visits to his hometown. In evaluating this option, DOD identified several sites that were considered and analyzed potential costs for each of these sites. In addition, DOD analyzed the benefits, such as cost savings, and drawbacks associated with the various sites and concluded that the cost outweighed the benefit of an additional ASA site at this location.
  - *Acquire capabilities to address a perceived threat.* NORAD wants DOD to acquire a number of capabilities for ASA operations to address a capability gap that NORAD believes exists based on its ASA computer model. While NORAD has identified some of the potential costs associated with one of the new capabilities, it did not include all of the costs associated with that capability; nor did it include costs associated with other capabilities that could be acquired. However, since NORAD requested these additional capabilities through DOD's Joint Capabilities Integration and Development System process, a cost-benefit analysis is not scheduled to occur until NORAD's proposal has been assessed and approved as part of that process.<sup>23</sup>
  - *Modify the number and location of ASA sites.* In 2010, NORAD analyzed its ASA basing strategy to identify whether it could change the number and location of ASA sites without affecting its ability to defend the homeland from aviation-related attack. NORAD's analysis determined that the probability of success of an attack increased as the number of ASA sites decreased. The analysis also identified a "point of diminishing returns" below which the number of ASA sites could not be further reduced without assuming an unacceptable level of risk. However, the analysis did not identify potential cost savings that could result from eliminating a given number of sites. Should NORAD, DOD, or Congress consider modifying the number and location of ASA sites in the future, without an analysis that balances both risk and costs, decision makers will be unable to make fully informed decisions about whether the potential cost savings (or increase) warrants the corresponding increase (or decrease) in risk.

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<sup>23</sup>The Joint Capabilities Integration and Development System analysis process is a requirements-generation system intended to prioritize and ensure that the most-essential needs of the warfighter are met. According to this process, when a material solution is recommended to mitigate a capability gap, an analysis of alternatives is generally conducted that evaluates the performance, operational effectiveness, operational suitability, and the estimated costs of an alternative to meet a mission capability.

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We could not evaluate the extent to which DOD implemented the last two phases—management selection, and implementation and monitoring—because (1) DOD had not fully implemented the first three phases of GAO’s risk-based management framework, which are essential for the last two phases, and (2) DOD was still in the managerial-selection phase for the alternatives that we identified.

While we are encouraged that DOD has examined some alternatives to its current ASA operations, adopting a more-rigorous risk-based management approach—including balancing risk and costs—would help decision makers within DOD and elsewhere more-effectively allocate finite DOD resources.

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## **Weak Internal Controls Limit the Ability of the Air Force and National Guard Bureau to Accurately Identify ASA Expenditures**

Internal control weaknesses limit the Air Force’s ability to accurately identify expenditures with regard to Air Force management of ASA operations. Without accurate expenditure information, Congress, NORAD, and DOD will not have an accurate basis for decision making and realistic budget formulation.

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### **Air Force and National Guard Bureau Officials Have Not Accurately Identified ASA Expenditures**

We analyzed the fiscal year 2010 expenditure information the Air Force and National Guard Bureau submitted to Congress<sup>24</sup> and found that it did not accurately identify all ASA expenditures.<sup>25</sup> According to the Air Force’s submission to Congress, more than \$246 million was expended on ASA operations in fiscal year 2010. While the Air Force included all of the mandated funding requirements categories in its budget-justification

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<sup>24</sup>In 2008, Congress mandated that for fiscal year 2010 and each year thereafter, the Secretary of Defense submit to the President for consideration by the President for inclusion with the budget materials submitted to Congress a consolidated budget justification that covers all programs and activities of the ASA mission of the Air Force, including military-personnel expenditures; flying hours; and any other associated ASA mission expenditures of the Air Force and the Air National Guard.

<sup>25</sup>For the purpose of this review, we evaluated the ASA fiscal year 2010 expenditures included in the fiscal year 2012 budget-justification documents because at the time of our review it was the most-recent budget justification reflecting resources spent on ASA operations.



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document, we found three areas in which the expenditures reported by the Air Force were inaccurate.

First, we found that the Air Force overstated its ASA flying-hour expenditures by at least \$22 million. According to Air Force officials, they mistakenly used a placeholder for the ASA flying-hour expenditure of approximately \$57.6 million, instead of using the actual flying-hour expenditure data. During the course of our review, the Air Force provided us with actual flying-hour data, which showed that the service expended \$35.6 million—38 percent less than reported.

Second, the ASA budget-justification document included expenditures that were not associated with ASA operations. For example, it included flying-hour and personnel expenditures related to non-ASA homeland-defense missions, such as air patrols protecting the President and national special-security events. Hence, it is likely that the Air Force further overstated its ASA flying-hour expenditures beyond the \$22 million discussed above.

Third, the budget justification document the Air Force provided to Congress did not include some expenditures that are related to ASA. While the budget justification included one military construction project for a munitions storage unit at the Toledo, Ohio, ASA site, it did not include any other expenditures associated with constructing, maintaining, and upgrading ASA facilities in fiscal year 2010. For example, when asked if the officials included the construction expenditures related to establishing an ASA site at McEntire Joint National Guard Base, South Carolina, in fiscal year 2010, such as constructing hangars for the alert fighter jets and upgrading crew quarters, the officials stated that these expenditures were not included in the ASA budget justification. However, we asked budget officials at each site about ASA expenditures for fiscal year 2010 in a survey. According to their responses and additional information from command officials, ASA sites as a whole spent at least \$3.8 million in facilities construction, maintenance, and equipment that was not included in the budget justification.

When asked to identify the expenditures included in the budget justification and the process by which the ASA expenditures were compiled, the Air Force and National Guard Bureau could not answer many of our questions regarding which detailed expenditures were included under the expenditure totals listed in the budget justification. Since the Air Force and National Guard Bureau were unable to accurately identify the expenditures to conduct ASA operations, we conducted a

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survey of all ASA sites in an effort to identify approximate expenditures for fiscal year 2010. According to the information obtained from this survey, the expenditures for each unit to conduct ASA operations during fiscal year 2010 ranged from \$2 million to \$8 million, with the average site expenditure being approximately \$5 million.

In addition, Air Force and National Guard Bureau officials told us they did not have documentation or guidance outlining how the ASA expenditures were defined, identified, and compiled for the budget justification. DOD is required by various statutes to improve its financial-management processes, controls, and systems to ensure that complete, reliable, consistent, and timely information is prepared and responsive to the financial information needs of agency management and oversight bodies.<sup>26</sup> Additionally, GAO's Standards for Internal Control in the Federal Government cite the importance of developing detailed internal-controls policies, procedures, and practices to ensure basic accountability, maintain funds control,<sup>27</sup> and prevent fraud and abuse.<sup>28</sup> Such efforts should include clearly defined roles and responsibilities and accurate and complete guidance on defining and tracking ASA expenditures. Without adequate internal controls in place, the Air Force's ability to accurately identify ASA expenditures will be limited.

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### Unclear ASA Roles and Responsibilities Contributed to Weaknesses in the Identification of ASA Expenditures

The Air Force and National Guard Bureau lack clearly defined programming and budgeting roles and responsibilities for ASA operations, which in turn limited the Air Force's ability to identify ASA expenditures. We found that the Air Force and National Guard Bureau have not clearly defined programming and budgeting roles and responsibilities since the Air Force canceled its 2003 ASA program action directive in 2009. The directive required the service's Air Combat Command to program for ASA operations. As a result, Air Combat Command programmed and

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<sup>26</sup>These statutes include the Chief Financial Officers Act of 1990, the Government Management Reform Act of 1994, the Federal Financial Management Improvement Act of 1996, and various annual authorization and appropriation act provisions.

<sup>27</sup>Funds controls are controls over the use of public funds, including (1) using public funds efficiently and effectively and for the purposes and within the time frames and amounts prescribed by law; (2) making payments to the right parties in the correct amount within allowable time frames and recouping any improper payments; and (3) accurately recording and reporting on transactions and use of public funds.

<sup>28</sup>[GAO/AIMD-00-21.3.1](#).

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budgeted for ASA operations between 2003 and 2009. However, since the directive was canceled and no additional guidance was issued, Air Combat Command stopped programming, planning, and budgeting for ASA operations at Air National Guard sites. National Guard Bureau officials told us that they consequently assumed these responsibilities. However, Bureau officials have questions about the bureau's authority to fund and conduct ASA operations in the manner in which they are currently conducted. We have requested the Air Force's official position regarding whether the Air National Guard should be conducting this mission under a Title 10 or Title 32 status. As of January 2012, the Air Force had not responded to our inquiry. We also found other internal-control weaknesses, such as a lack of oversight of funds expended for ASA operations. According to a National Guard Bureau internal-review report, a lack of oversight and other internal-control weaknesses, such as poor guidance, led to improper compensation at several ASA sites that are operated by Air National Guard units.<sup>29</sup> Without clearly defined roles and responsibilities, questions about who is responsible for programming, planning, and budgeting will remain; and the ability to accurately identify ASA expenditures will be limited. In addition, the Air Force and National Guard Bureau may remain vulnerable to improper use of limited resources.

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**The Air Force and National Guard Bureau's Lack of Guidance on Defining and Tracking ASA Expenditures Limited Its Ability to Accurately Identify ASA Expenditures**

Air Force and National Guard Bureau financial-management officials told us that they did not accurately capture the ASA expenditures because they lacked guidance that defines ASA operations and the process to track the associated expenditures. First, as mentioned previously in the report, there is no agreed-upon definition of ASA operations among NORAD and DOD components that contribute to ASA operations. Consequently, the financial-management guidance does not clearly define the expenditures that should be associated with ASA operations. Instead, the guidance that is provided to the Air Force by the Office of the Under Secretary of Defense (Comptroller) contains broad categories that do not clearly state what specific expenditures should or should not be included in the budget exhibit.<sup>30</sup> For example, the guidance associated

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<sup>29</sup>According to the National Guard Bureau, federal authorities are working to recover the improper compensation.

<sup>30</sup>The Office of the Under Secretary of Defense (Comptroller) could not find the original ASA budget-justification guidance and template so it recreated the template for the purposes of our audit.

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with identifying ASA military-personnel expenditures states that Air Force officials should provide military-personnel costs associated with the military full-time equivalents supporting the ASA mission. Since the guidance does not clearly identify the type or group of military personnel who are associated with ASA, financial managers could respond to this reporting requirement with a range of different personnel, such as personnel that work at NORAD's air-defense sectors and DOD's refueling units since they assist in ASA operations, but are not necessarily included within the 18 alert sites.

Second, Air Force and National Guard Bureau financial-management officials told us that they had not issued any guidance explaining the process for tracking ASA expenditures at the local level. According to Air Force guidance, financial managers and budget officers at all levels must make sure that operating personnel are made aware of the importance of properly identifying and capturing all costs associated with emergency and special programs, like ASA, because only accurate cost data can provide the documentation to meet reporting requirements. Guidance to the local level on the process of tracking ASA expenditures would be important because Air Force and National Guard Bureau officials told us that they develop the ASA budget justification using the information that the financial managers at the ASA sites enter into the service's accounting systems. While the National Guard Bureau's annual financial-management guidance does not include any information on tracking ASA expenditures, we found that it does contain specific financial-management guidance for a similar mission. Specifically, the Air National Guard's counterdrug mission is similar to the ASA mission in that they both involve Guard personnel supporting a federal mission and have specific accounting codes dedicated to tracking their expenditures. When we asked about this disparity, National Guard Bureau financial-management officials acknowledged that there was not a good reason for having not included more guidance about tracking ASA expenditures and told us that the bureau would address this in the next version of the guidance. However, a new version of the National Guard Bureau's financial-management guidance was subsequently issued and it did not include guidance on tracking ASA expenditures. National Guard Bureau financial-management officials stated that changes to the guidance will be driven by a number of factors, including appropriations law, questions from their comptrollers in the field, and our findings. Without clear guidance on defining and tracking ASA expenditures, unit officials will be unable to provide Air Force and National Guard Bureau officials accurate and consistent ASA expenditure information.

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## Conclusions

Since the September 11, 2001, terrorist attacks, the U.S. government has taken extensive efforts to protect the airspace over the United States, aviation threat profiles have changed, and fiscal resources have become more constrained. Nevertheless, NORAD and DOD have not fully evaluated how to most-effectively manage ASA operations in this current environment. Until the Air Force fully implements the recommendations identified in our January 2009 report, including establishing ASA as a steady-state mission by updating Air Force homeland-defense policy and doctrine, concerns about the long-term sustainability of ASA operations will remain. Additionally, until DOD defines ACA; identifies the specific capabilities that support it, including personnel and equipment; and distinguishes the place of ASA within that mission for the purposes of meeting Congress's budget-justification requirement, Congress, NORAD, and other entities within DOD could be making important homeland-security decisions based on different definitions and a resulting variance in understanding of what is required to accomplish that mission.

Further, in this environment, it is critical that DOD makes basing, acquisition, and other decisions about ASA operations on the basis of risk-management principles that balance risk and costs. These principles include establishing performance measures; identifying and prioritizing locations that should be protected; utilizing accurate, comprehensive, and documented risk assessments; and conducting cost-benefit analyses for alternatives. With a more-rigorous, risk-based management approach, DOD and congressional decision makers would be in a better position to effectively allocate resources. Finally, unless the Air Force addresses internal-control weaknesses that limit its ability to identify ASA expenditures, Congress, NORAD, and DOD will not have an accurate basis for investment decision making and realistic budget formulation.

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## Matter for Congressional Consideration

In order to ensure that the Air Force is taking action that addresses the long-term sustainability of ASA operations, Congress may wish to consider requiring the Secretary of the Air Force to fully implement the remaining actions identified in our 2009 report within a time period that Congress believes most prudent.

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## Recommendations for Executive Action

To address these issues, we recommend that the Secretary of Defense take the following seven actions.

In order that all DOD components may better understand the mission they have been asked to perform, we recommend the Secretary of Defense

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direct the Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs, in coordination with the Joint Chiefs of Staff, to clearly define ASA operations and its relationship to NORAD's ACA operations.

In order to implement a more-complete risk-based management approach that balances risk and costs for ASA operations, we recommend the Secretary of Defense take the following five actions:

- Direct the Joint Chiefs of Staff, in coordination with the U.S. element of NORAD and U.S. Pacific Command, to develop performance measures for ASA operations and then use these measures to evaluate the mission and make adjustments, as warranted, on the basis of the performance-measure results.
- Direct the Office of the Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs, in coordination with the Joint Chiefs of Staff, to issue updated guidance, which includes a prioritized list of metropolitan areas and critical infrastructure that NORAD is supposed to protect.
- Direct the U.S. element of NORAD to update its ASA computer model to address identified areas for improvement to include incorporating the elements of risk—threat, vulnerability, and consequence.
- Direct the U.S. element of NORAD to document the results of its risk assessments so that NORAD and DOD can identify trends over time.
- Identify the appropriate DOD entities that should conduct a comprehensive cost-benefit analysis of NORAD's ASA basing strategy and then have those entities conduct such an analysis.

In order to accurately identify ASA expenditures and address other internal control weaknesses, we recommend that the Secretary of Defense direct the Secretary of the Air Force and the Director of the National Guard Bureau to issue guidance that

- defines ASA programmatic and budgeting roles and responsibilities;
- defines all expenditures that should be identified as ASA expenditures in financial-management systems; and
- identifies the proper procedures to track ASA expenditures in their financial-management systems.

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## Agency Comments and Our Evaluation

In written comments on a draft of this report, DOD stated that it concurred with one of our recommendations and partially concurred with the other six recommendations. However, DOD did not consistently identify specific actions that it would take to implement the recommendations and

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it did not identify time frames for implementing the recommendations. DOD's comments are reprinted in appendix III. The Department of Homeland Security and the Federal Bureau of Investigation also reviewed a draft of this report but did not provide any comments.

DOD concurred with our recommendation to clearly define ASA operations and its relationship to NORAD's ACA operations and stated that all organizations involved in the air sovereignty mission would use standard terminology and that the new terminology would be reflected in subsequent plans, execute orders, and DOD publications.

DOD partially concurred with our recommendation to develop performance measures for ASA operations, but did not identify any specific actions that it would take to implement the recommendation. In its comments, DOD stated that it recognizes the merit of, and routinely employs performance measures that are incorporated into military service training requirements. However, NORAD officials told us during our review that the command had not developed any performance measures for ASA operations. Consequently, we believe that the development and use of ASA-related performance measures would improve DOD's ability to assess the overall effectiveness of its ASA operations and enhance the performance measures to which DOD referred to in its comments.

DOD partially agreed with our recommendation that it issue updated guidance, which includes a prioritized list of metropolitan areas and critical infrastructure that NORAD is supposed to protect. DOD stated that the current guidance on prioritized metropolitan areas and critical infrastructure was produced by the National Security Staff and the criteria used to produce it are still valid. However, this guidance has not been updated since shortly after September 11, 2001, and DOD has produced other similar lists within the department that it uses in some contexts. For these reasons, we continue to believe that DOD should consider updating existing guidance or developing new guidance concerning a prioritized list of metropolitan areas and critical infrastructure locations. We anticipate that NORAD and DOD could seek additional guidance from the National Security Staff if they believe the Staff's guidance needs to be reviewed or updated. Such actions would better ensure that key national security organizations have consistent and up to date expectations.

DOD partially concurred with our recommendation to direct the U.S. element of NORAD to update its ASA computer model to address identified areas for improvement to include incorporating the elements of risk—threat, vulnerability, and consequence. In its comments, DOD stated that NORAD determines mission risk by evaluating its computer

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model results (based on vulnerability, threat capability, and targets of consequence) and comparing the results to intelligence assessments of threat intent. However, our analysis of the model found that it did not incorporate threat, vulnerability, and consequence (or criticality) data because NORAD designed the model to assess the ability of its aircraft to respond to a single type of threat regardless of its location in the United States. DOD's comments also stated that NORAD would explore improvements to the ASA model in support of NORAD/NORTHCOM decision making as targets and threats evolve and capabilities improve. We continue to believe it appropriate that NORAD's future improvements to the model should include the three components that DOD has long-considered essential in risk assessments: threat, vulnerability, and consequence (or criticality). Such actions would be consistent with DOD's other efforts to protect its people, property, and systems from attacks. We also expect that future improvements to the model will include the specific areas we identified in the classified version of this report.

DOD partially concurred with the recommendation to direct the U.S. element of NORAD to document the results of its risk assessments so that NORAD and DOD can identify trends over time. In its response, DOD identified several NORAD studies or assessments—including a 2009 Collateral Damage Study and the 2010 ASA Basing Study—that are subject to trend analysis. We believe that NORAD's efforts to study or analyze different aspects of its missions are positive actions. However, while NORAD issued a one-time report to Congress in March 2011 that identified the results of its 2010 ASA Basing Study, a one-time study is not a trend analysis and the command has not documented the results of its analyses of the ASA model since that time. We continue to believe that DOD should document over time the results of analyses stemming from the ASA basing model itself. This would provide a valuable reference of the model's inputs and outputs over time and improve the ability of current and future leaders to identify and address evolving threats within U.S. airspace.

DOD partially concurred with our recommendation that the Secretary of Defense should identify the appropriate DOD entities that should conduct a comprehensive cost-benefit analysis of NORAD's ASA basing strategy and then have those entities conduct such an analysis. The response stated that multiple cost-benefit analyses have been conducted on NORAD's ASA basing strategy by NORAD, OSD Cost Assessment and Program Evaluation, the Joint Staff, the Department of Air Force, and the Office of the Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs. However, when we asked NORAD and DOD officials, including some of those listed above, for the cost-benefit



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analysis of its basing strategy (i.e. potential cost savings that could result from eliminating a given number of sites), the officials told us that such an assessment had not been completed. Further, when we asked which organization would be responsible for completing such studies, the officials provided us conflicting views of whose responsibility it would be. Nonetheless, DOD's comments also recognize that such cost-benefit analyses are critical for NORAD's force posturing. As such, we believe that NORAD and DOD's ability to demonstrate its use of these cost-benefit analyses in future decision making efforts will help to ensure effective mission capability consistent with the current fiscal environment.

DOD partially concurred with our recommendation to direct the Secretary of the Air Force and the Director of the National Guard Bureau to issue guidance that addresses internal control weaknesses that kept the Air Force from providing accurate ASA expenditure information to Congress. Such weaknesses included unclear roles and responsibilities; lack of guidance that identified expenditures that should be identified as ASA expenditures in financial-management systems; and proper procedures to track ASA expenditures in their financial-management systems. In its response, DOD stated that it believes that programmatic and budgetary roles are clearly understood and well defined in DOD's planning, programming, budgeting, and execution process. However, the Air Force's inability to provide Congress an accurate reporting of resources used for ASA operations indicates that internal control weaknesses exist that have not been mitigated by DOD's standard process. For example, officials from the Air Force's homeland defense office, the National Guard Bureau, and the Air Force's Combat Command could not provide us any documentation of which organization is responsible for programming and budgeting for ASA operations since the Air Force canceled its ASA program action directive in 2009.

As a result of these weakness, the Air Force provided Congress inaccurate information about its fiscal year 2010 ASA expenditures—ranging from overstating its flying hour costs by at least 38 percent to understating its facilities construction, maintenance, and equipment expenditures. DOD's response did not indicate that it would issue guidance to address these internal control weaknesses. Given the current fiscal environment, DOD should identify and take specific actions immediately to address our findings so that Congress, NORAD, and DOD will have an accurate basis for decision making and realistic budget formulation.

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We are sending copies of this report to appropriate congressional committees, the Secretary of Defense, the Commander of NORAD, the Secretary of the Air Force, the Commissioner of Customs and Border Protection, the Director of the Federal Bureau of Investigation, the Administrator of the Transportation Security Administration, the Commandant of the U.S. Coast Guard, and the Director of OMB. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-4523 or [leporeb@gao.gov](mailto:leporeb@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IV.

A handwritten signature in black ink, appearing to read "Brian Lepore". The signature is fluid and cursive, with the first name "Brian" and last name "Lepore" clearly distinguishable.

Brian J. Lepore  
Director, Defense Capabilities and Management

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*List of Requesters*

The Honorable Adam Smith  
Ranking Member  
Committee on Armed Services  
House of Representatives

The Honorable J. Randy Forbes  
Chairman  
The Honorable Madeleine Z. Bordallo  
Ranking Member  
Subcommittee on Readiness  
Committee on Armed Forces  
House of Representatives

The Honorable Roscoe G. Bartlett  
Chairman  
The Honorable Silvestre Reyes  
Ranking Member  
Subcommittee on Tactical Air and Land Forces  
Committee on Armed Forces  
House of Representatives

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# Appendix I: Scope and Methodology

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To determine the extent to which the Air Force has implemented the recommendations from our 2009 report, we interviewed officials from the Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs, the Air Force's homeland-defense office, the Air Force's Air Combat Command, the National Guard Bureau, and three air sovereignty alert (ASA) units. We gathered information about steps taken related to the recommendations and obtained supporting documentation, when possible. In those cases where the Air Force had taken action, we asked the officials about the effect that the action had on their operations. In those cases where the Air Force had not taken action, we asked the officials to identify the rationale for lack of action and the plan that they had in place—including time frames—to implement the recommendations.

To determine the extent to which the Department of Defense (DOD) has adopted a risk-based management approach to balance risk and costs for ASA operations, we reviewed and analyzed applicable documentation and interviewed relevant officials. Specifically, we reviewed prior GAO reports that recommended organizations use a risk-based management approach to manage risk and costs.<sup>1</sup> We reviewed documents and interviewed officials from the Office of the Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs, the Air Force, and the North American Aerospace Defense Command (NORAD) to determine the extent to which NORAD has followed a risk-based management approach for ASA operations. We reviewed NORAD's ASA assessments and compared them to the elements required for a risk assessment. We reviewed acquisition documentation to determine whether the command considered the cost and benefits when considering alternatives for ASA operations. During our discussions with officials, we asked how and whether they measure the performance of ASA operations and whether they consider cost for ASA operations. To help us

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<sup>1</sup>GAO, *Joint Strike Fighter: Strong Risk Management Principles Essential as Program Enters Most Challenging Phase*, [GAO-09-711T](#) (Washington, D.C.: May 20, 2009); *Intelligence, Surveillance, and Reconnaissance: DOD Needs a Strategic, Risk-Based Approach to Enhance Its Maritime Domain Awareness*, [GAO-11-621](#) (Washington, D.C.: June 20, 2011); *Defense Acquisitions: Managing Risk to Achieve Better Outcomes*, [GAO-10-374T](#) (Washington, D.C.: May 20, 2009); *Aviation Security: DHS and TSA Have Researched, Developed and Begun Deploying Passenger Checkpoint Screening Technologies, but Continue to Face Challenges*, [GAO-10-128](#) (Washington, D.C.: Oct. 7, 2009); and *Risk Management: Further Refinements Needed to Assess Risks and Prioritize Protective Measures at Ports and Other Critical Infrastructure*, [GAO-06-91](#) (Washington, D.C. Dec. 15, 2005).

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better understand whether DOD incorporates risk into ASA operations, we reviewed documentation on how other agencies incorporate risk into their missions. We then reviewed documentation on NORAD's Operation Noble Eagle Fighter Basing Location Model and analyzed the model's inputs and assumptions.<sup>2</sup> We interviewed officials from NORAD on how it operationalizes the model in support of ASA operations.

In order to determine the extent to which the Air Force was able to accurately identify ASA expenditures, we analyzed the fiscal year 2010 expenditure information the Air Force included in its fiscal year 2012 ASA budget-justification document. We documented the steps taken to identify and compile the ASA expenditures through interviews, e-mails, and related documentation. We then compared the information and practices used by the Air Force to prepare the ASA budget justification against cost-evaluation best practices consistently applied by organizations throughout the federal government. Specifically, we evaluated the budget justification to determine whether it included all expenditures associated with ASA operations;<sup>3</sup> whether it contained few, if any, mistakes; and whether the underlying documentation and expenditure calculations were well documented so that they could be easily repeated or updated. To determine the expenditures of each ASA site we developed a survey, which we sent out to the Air National Guard and active-duty ASA units to gather fiscal year 2009 and 2010 expenditures. We developed the expenditure survey by gathering ASA operations-requirement documentation that outlined the personnel, operational, and facilities requirements for conducting ASA operations. In order to ensure greater reliability in the expenditure information we gathered from the ASA sites, we instructed the sites to separate non-ASA Operation Noble Eagle expenditures from ASA expenditures; include all of the ASA construction and maintenance expenditures; and to remove duplications in their responses. We also consulted with two Air National Guard and two active duty ASA sites to verify the accuracy and completeness of the survey's instructions, parameters, and expenditure categories. We found the data gathered in this survey to be sufficiently reliable for our purposes.

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<sup>2</sup>The Operation Noble Eagle Fighter Basing Location Model is a Monte Carlo simulation that creates events and evaluates how effective the response will be, given a predefined fighter posture and location.

<sup>3</sup>We defined ASA operations as the fully fueled, fully armed aircraft and trained personnel on alert 24 hours a day, 365 days a year, and the infrastructure, equipment, and supplies required to maintain them at the 18 ASA sites across the United States.

# Appendix II: Air Force's Implementation of Our 2009 Recommendations as of November 2011

Recommendation	Actions taken
<p>We recommend that the Secretary of Defense direct the military services with units that consistently conduct Air Sovereignty Alert (ASA) operations to formally assign ASA duties to these units and then ensure that the readiness of these units is fully assessed, to include personnel, training, equipment, and ability to respond to an alert.</p>	<p><b>Fully Implemented:</b> The National Guard Bureau, in coordination with Air Combat Command, initially implemented this recommendation by placing ASA operations on the units' secondary mission statements.<sup>a</sup> However, the National Guard Bureau told us that it does not believe that the Secretary of Defense has formally assigned ASA operations to the Air National Guard units. As of November 2011, bureau officials told us that they were taking action to remove the reference to ASA operations from these statements because they now believe that they could better address the findings identified in the 2009 report through the Air Force's standard deployment process.</p> <p>However, North American Aerospace Defense Command (NORAD) does not believe that the National Guard Bureau should remove the reference to ASA operations from the units' secondary mission statements. NORAD officials told us that they do not support the bureau's position because NORAD experienced some challenges when it placed units that do not normally sit alert on alert for the 10th anniversary of the September 11, 2001, terrorist attacks. While our assessment gives the Air Force credit for having taken action, we are also concerned that removing the reference to ASA operations from the units' secondary mission statements could have adverse effects, such as the units not reporting the extent to which they are able to conduct both their ASA operations and overseas deployments in their appropriate readiness systems. It is too early to determine the consequences of the bureau's decision, although a bureau official acknowledged that the problems we identified in our 2009 report could reoccur if this new approach with NORAD was not fully implemented.</p>
<p>We recommend that the Secretary of Defense direct the Secretary of the Air Force to implement ASA as a steady-state mission according to NORAD, Department of Defense (DOD), and Air Force guidance by</p> <ul style="list-style-type: none"> <li>(1) incorporating ASA operations within the Air Force submissions for the 6-year Future Years Defense Program;</li> <li>(2) updating the Air Force homeland defense policy, homeland operations doctrine, and concept of operations to incorporate and define the roles and responsibilities for ASA operations; and</li> <li>(3) updating and implementing the ASA program action directive.</li> </ul>	<p><b>Partially Implemented:</b> The Air Force has taken one of three steps to implement ASA as a steady-state mission. Specifically:</p> <ul style="list-style-type: none"> <li>(1) The National Guard Bureau has incorporated ASA operations in its fiscal year 2013 Future Years Defense Program.</li> <li>(2) The Air Force had not updated any of the identified documents. Consequently, overall roles and responsibilities remain undefined.</li> <li>(3) Rather than updating and implementing the ASA program action directive, the Air Force cancelled the program action directive. This leaves the Air Force and the National Guard Bureau without clear roles and responsibilities for operational planning, programming, and budgeting for ASA operations, which GAO has identified as an internal control weakness.</li> </ul>
<p>We recommend that the Secretary of Defense direct the Secretary of the Air Force to establish a timetable to implement ASA as a steady-state mission [by taking the actions identified in the preceding recommendation].</p>	<p><b>Not Implemented:</b> The Air Force has not established a timetable to implement ASA as a steady-state mission.</p>

Recommendation	Actions taken
<p>We recommend that the Secretary of Defense direct the Secretary of the Air Force to develop and implement a plan to address any projected capability gaps in ASA units due to the expected end of the useful service lives of their F-15 and F-16 fighter aircraft.</p>	<p><b>Minimally Implemented:</b> The Air Force has taken some action that could mitigate potential challenges, if proactively managed, but has not developed a single plan to manage the recapitalization of the aircraft that conduct ASA operations. Specifically, the service has initiated efforts to test the effective service life of its remaining F-15 and F-16 fleets. In addition, the service has requested funding to update both platforms with radar and communication equipment that will support ASA operations. The Air Force has also identified the extent to which it could cover its alert sites if either the F-15 or F-16 fleet were unavailable.</p> <p>However, the potential grounding of ASA aircraft—such as the grounding of F-15s during 2007 and F-22s during 2011, the ongoing delays in the F-35 program, and the unspecified fielding locations for the F-35 aircraft could pose challenges in the future. Further, the Air Force could have challenges if the retirement of the current fleet of F-15s and F-16s are not managed in a manner that considers the effect on ASA operations. For example, if the Air Force were to decrease the number of older models of F-16s in the inventory, this could affect ASA operations since these aircraft are flown by units that conduct these operations. Also, if the Air Force retires the fleet of F-15s and F-16s with the longest remaining effective service lives before those with shorter service lives, the service could experience a shortage in fighter aircraft available for ASA operations before the 5th-generation aircraft are available.<sup>b</sup></p>
<p>We recommend that the Secretary of Defense direct the Secretary of the Air Force to develop and implement a formal method to replace deploying units that still provides unit commanders flexibility to coordinate replacements.</p>	<p><b>Minimally Implemented:</b> In response to this recommendation, DOD noted that it has a global force-management system that it uses to formally manage its forces around the world. However, the approach that DOD uses to backfill personnel and units for ASA operations is still managed on an ad hoc basis.</p> <p>NORAD and the Air Force have developed some planning documents, such as a plan for backfilling ASA units on a large scale. For example, one of the planning documents identifies potential units that could conduct ASA operations at bases that are equipped with F-15s if those aircraft were grounded for a period of time as they were in 2008. In addition, Air Combat Command and the National Guard Bureau developed a memorandum of understanding that identifies a process by which Air National Guard units will be scheduled to support non-ASA Operation Noble Eagle missions, such as national special-security events, throughout the year, if called upon. The agreement identifies a process by which Air National Guard units will be identified and scheduled to support these missions, if called upon, and the time frame during which each unit will be ready to support these missions. It also identifies Air Combat Command as the command that will be responsible for providing funds to those units when called upon.</p> <p>However, the Air Force has not developed similar Operation Noble Eagle planning documents to replace ASA units that deploy to support overseas operations or units that are taken off alert for a short period of time when they fail an alert force evaluation. Consequently, the National Guard Bureau, in coordination with Air Combat Command, must try to find personnel and equipment that are available to support these units. In addition, since it is unclear who is responsible for funding these backfill efforts, the National Guard Bureau must use funds that were programmed for other purposes to cover these costs.</p>

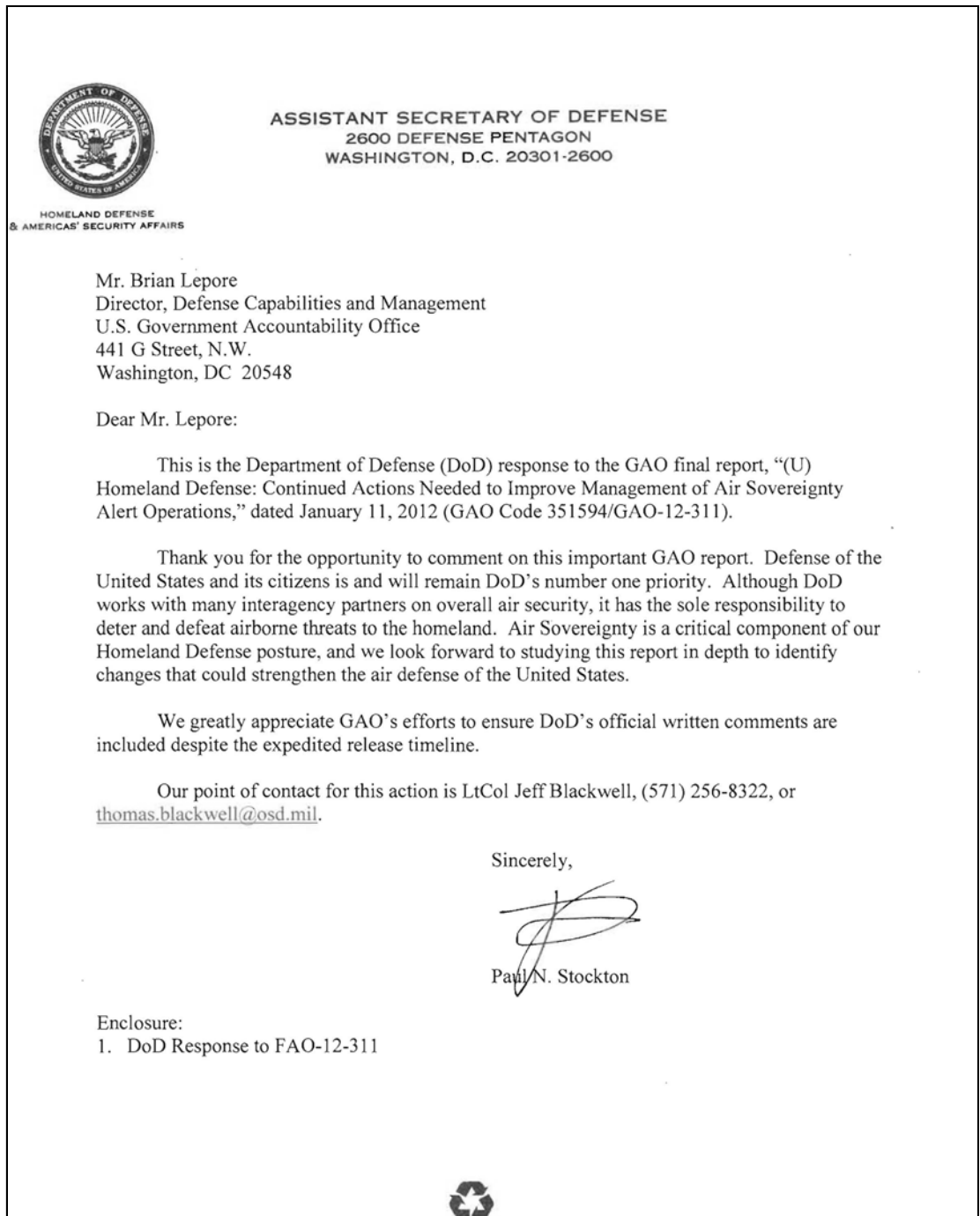
Source: GAO analysis of DOD information.

<sup>a</sup>The Air Force issues mission designed operational capabilities statements that identify the unit's mission(s) and related requirements (e.g., type and number of personnel). The unit's readiness is based on these requirements.

<sup>b</sup>Fifth-generation aircraft, such as the F-22 and F-35, have stealth characteristics, fused sensor data, and advanced radars.

# Appendix III: Comments from the Department of Defense

Note: GAO received Department of Defense comments on January 27, 2012.





GAO REPORT – DATED JANUARY 11, 2012  
GAO CODE 351594/GAO-12-311

“(U) HOMELAND DEFENSE: Continued Actions Needed to Improve Management of  
Air Sovereignty Alert Operations”

DEPARTMENT OF DEFENSE COMMENTS  
TO THE RECOMMENDATIONS

**RECOMMENDATION 1:** “In order that all DoD components may better understand the mission they have been asked to perform, GAO recommends that the Secretary of Defense direct the Assistant Secretary for Homeland Defense and Americas’ Security Affairs, in coordination with the Joint Chiefs of Staff, to clearly define ASA operations and its relationship to NORAD’S ACA operations.”

**DoD RESPONSE:** Concur. OSD will coordinate with the Joint Staff, NORAD/USNORTHCOM, and the National Guard Bureau (NGB) to ensure standard terminology is used by all organizations involved in the Air Sovereignty mission and is reflected in subsequent plans, execute orders, and DoD publications. This standardization will also assist in implementing GAO Recommendation #3 as it relates to reporting and accounting for this mission.

**RECOMMENDATION 2:** “In order to implement a more complete risk-based management approach that balances risk and costs for ASA operations, GAO recommends that the Secretary of Defense take the following actions:

- “Direct the Joint Chiefs of Staff, in coordination with the U.S. element of NORAD and U.S. Pacific Command, to develop performance measures for ASA operations and then use these measures to evaluate and make adjustments, as warranted, based on the performance measure results.”

**DoD RESPONSE:** Partially Concur. DoD recognizes the merit of, and routinely employs measures of performance. The Military Departments are tasked with preparing and certifying combat units for use by Combatant Commanders. Each Military Department has long-established procedures and measures of performance to certify units as combat ready. Combatant Command-specific measures of effectiveness and performance deemed critical to mission execution are incorporated into Service training requirements.

- “Direct the Office of the Assistant Secretary of Defense for Homeland Defense and Americas’ Security Affairs, in coordination with the Joint Chiefs of Staff, to issue updated guidance, which includes a prioritized list of metropolitan areas and critical infrastructure that NORAD is supposed to protect.”

**DoD RESPONSE:** Partially Concur. The National Security Staff (NSS) produced the current guidance on prioritized metropolitan areas and critical infrastructure. The criteria used to produce the guidance are still valid. OSD welcomes the opportunity to review and update the guidance as required.

- “Direct the U.S. element of NORAD to update its ASA computer model to address identified areas for improvement to include incorporating the elements of risk-threat, vulnerability, and consequence.”

**DoD RESPONSE:** Partially Concur. NORAD determines mission risk by evaluating its computer model results (based on vulnerability, threat capability, and targets of consequence) and comparing the results to intelligence assessments of threat intent. NORAD does, and will continue to explore improvements to the ASA model in support of NORAD/USNORTHCOM decision making, as targets and threats evolve, and capabilities improve.

- “Direct the U.S. element of NORAD to document the results of its risk assessments so that NORAD and DOD can identify trends over time.”

**DoD RESPONSE:** Partially Concur. NORAD conducts numerous formal studies/risk assessments (e.g., 2009 Collateral Damage Study, 2010 ASA Basing Study) that are subject to both formal and informal trend analysis. DoD recognizes the value of this trend analysis and will continue to work with NORAD to understand current risk and to track changes over time.

- “Identify the appropriate DOD entities that should conduct a comprehensive cost-benefit analysis of NORAD’s ASA basing strategy and then have those entities conduct such an analysis.”

**DoD RESPONSE:** Partially Concur. Multiple cost-benefit analyses have been and will continue to be conducted on NORAD’s ASA basing strategy, as they are critical to NORAD force posturing. Previous efforts include those led by NORAD, OSD Cost Assessment and Program Evaluation (CAPE), the Joint Staff, the Department of the Air Force, and the OASD(HD&ASA).

**RECOMMENDATION 3:** “In order to accurately identify ASA expenditures and address other internal control weaknesses, GAO recommends that the Secretary of Defense direct the Secretary of the Air Force and the Director of the National Guard Bureau to issue guidance that:

- Defines ASA programmatic and budgeting roles and responsibilities;
- Defines all expenditures that should be identified as ASA expenditures in financial management systems; and
- Identifies the proper procedures to track ASA expenditures in their financial management systems.”

**DoD RESPONSE:** Partially Concur. Programmatic and budgetary roles are clearly understood. Responsibilities are well defined and established in the DoD Planning, Programming, Budgeting, and Execution (PPBE) process. The Secretary of the Air Force is responsible for ASA programming and budgeting and submits the ASA request as part of the annual Air Force budget request. OSD will continue to work with the Secretary of the Air Force to clarify and standardize tracking and ASA expenditures.

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# Appendix IV: GAO Contacts and Staff Acknowledgments

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## GAO Contacts

Brian J. Lepore, (202) 512-4523 or [leporeb@gao.gov](mailto:leporeb@gao.gov)

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## Staff Acknowledgments

In addition to the contact named above, the following individuals made significant contributions to this report: Davi M. D'Agostino, Director (retired); Joseph Kirschbaum, Assistant Director; James D. Ashley; Tommy Baril; Mark Braza; Susan C. Ditto; Brandon Jones; David F. Keefer; Charles W. Perdue; Karen A. Richey; Jeff M. Tessin; Amie M. Steele; Amanda G. Weldon; and Michael Willems.

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# Related GAO Products

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## Homeland Defense

*Homeland Defense: Actions Needed to Improve Management of Air Sovereignty Alert Operations to Protect U.S. Airspace.* [GAO-09-184](#). Washington, D.C.: January 27, 2009.

*Homeland Defense: Actions Needed to Address Management of Air Sovereignty Alert Operations to Protect U.S. Airspace.* [GAO-09-612T](#). Washington, D.C.: April 22, 2009.

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## DOD Tactical Aircraft

*Tactical Aircraft: Air Force Fighter Reports Generally Addressed Congressional Mandates, but Reflected Dated Plans and Guidance, and Limited Analyses.* [GAO-11-323R](#). Washington, D.C.: February 24, 2011

*Tactical Aircraft: DOD's Ability to Meet Future Requirements Is Uncertain, with Key Analyses Needed to Inform Upcoming Investment Decisions.* [GAO-10-789](#). Washington, D.C.: July 29, 2010.

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## Aviation Security

*Aviation Security: TSA Has Made Progress, but Additional Efforts Are Needed to Improve Security.* [GAO-11-938T](#). Washington, D.C.: September 16, 2011.

*Aviation Security: TSA's Revised Cost Comparison Provides a More Reasonable Basis for Comparing the Costs of Private-Sector and TSA Screeners.* [GAO-11-375R](#). Washington, D.C.: March 4, 2011.

*Transportation Security: Comprehensive Risk Assessments and Stronger Internal Controls Needed to Help Inform TSA Resource Allocation.* [GAO-09-492](#). Washington, D.C.: March 27, 2009.

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## Risk Management

*Intelligence, Surveillance, and Reconnaissance: DOD Needs a Strategic, Risk-Based Approach to Enhance Its Maritime Domain Awareness.* [GAO-11-621](#). Washington, D.C.: June 20, 2011.

*Defense Management: Comprehensive Cost Information and Analysis of Alternatives Needed to Assess Military Posture in Asia.* [GAO-11-316](#). Washington, D.C.: May 25, 2011.

*Defense Critical Infrastructure: Actions Needed to Improve the Identification and Management of Electrical Power Risks and Vulnerabilities to DOD Critical Assets.* [GAO-10-147](#). Washington, D.C.: October 23, 2009.

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*Risk Management: Strengthening the Use of Risk Management Principles in Homeland Security.* [GAO-08-904T](#). Washington, D.C.: June 25, 2008.

*Highlights of a Forum Convened by the Comptroller General of the United States: Strengthening the Use of Risk Management Principles in Homeland Security.* [GAO-08-627SP](#). Washington, D.C.: April 15, 2008.

*Homeland Security: Applying Risk Management Principles to Guide Federal Investments.* [GAO-07-386T](#). Washington, D.C.: February 7, 2007.

*Risk Management: Further Refinements Needed to Assess Risks and Prioritize Protective Measures at Ports and Other Critical Infrastructure.* [GAO-06-91](#). Washington, D.C.: December 15, 2005.

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## Financial Management

*Department of Defense: Financial Management Improvement and Audit Readiness Efforts Continue to Evolve.* [GAO-10-1059T](#). Washington, D.C.: September 29, 2010.

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